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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Call et al.	Attorney Docket No: MESO0045
Serial No:	10/066,404	Group Art Unit: 2856
Filed:	February 1, 2002	Examiner:
Title:	ROBUST SYSTEM FOR SCREENING MAIL FOR BIOLOGICAL AGENTS	

TRANSMITTAL LETTER FOR PETITION TO MAKE SPECIAL

Bellevue, Washington 98004

April 16, 2002

TO THE DIRECTOR OF THE PATENT AND TRADEMARK OFFICE:

Enclosed herewith is a Petition to Make Special related to the above-identified patent application. Also enclosed is an Information Disclosure Statement, Information Disclosure Statement Listing sheet, and eight references noted therein.

Our check No. 5851 in the amount of $130.00 to cover the petition fee is enclosed. Please charge any additional fees or credit any overpayment to Deposit Account No. 01-1940. A copy of this sheet is enclosed.

Respectfully submitted,

Ron Anderson

Ronald M. Anderson
Registration No. 28,829

I hereby certify that this correspondence is being deposited with the U.S. Postal Service in a sealed envelope as first class mail with postage thereon fully prepaid addressed to: Director of the Patent and Trademark Office, Arlington, VA 22202, on April 16, 2002.

Date: April 16, 2002

Kathy Parker

LAW OFFICES OF RONALD M. ANDERSON
600 - 108th Avenue N.E., Suite 507
Bellevue, Washington 98004
Telephone: (425) 688-8816 Fax: (425) 646-6314

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PETITION TO MAKE SPECIAL

Bellevue, Washington 98004

April 16, 2002

TO THE DIRECTOR OF THE PATENT AND TRADEMARK OFFICE:

In accord with requirements of 37 CFR §1.102, applicants hereby request an Advancement of Examination, based on applicants' invention being directed towards countering terrorism involving contamination of the mail with biological/chemical substances. The requisite petition fee of $130 under 37 CFR 1.17(h) is enclosed. A statement explaining how the invention contributes to countering this form of terrorism, a summary of the most relevant art found by applicants, and an explanation of how the present invention distinguishes over that art, are provided below, and copies are included with the Information Disclosure Statement submitted concurrently herewith.

REMARKS

How the Invention Contributes to Countering Terrorism

Letters contaminated with weapons-grade *Bacillus anthracis* (anthrax) spores passed through the United States Postal Service (USPS) after September 11, 2001. Over 16 cases of documented infections and several deaths have been directly attributed to such letters. By November 2001, over 32,000 individuals in the United States were taking antibiotics prescribed by physicians specifically as a prophylactic measure to combat a potential exposure to anthrax contaminated mail. Multiple mail processing facilities and the equipment within those facilities were contaminated by exposure to what appears to have been a statistically small number of intentionally contaminated letters.

It should be noted that the USPS relies heavily on automation to process over 550 million pieces of mail every day. At the present time, there exists no mail processing equipment with the capability to screen mail for anthrax contamination, or other types of biological or chemical contaminants. Unfortunately, anthrax is not the only agent of concern. It has been suggested that the smallpox virus, which has been virtually eradicated in the natural environment, could be cultivated and used as an agent of terror in much the same fashion as the anthrax mailings were. Also, extremely toxic chemical agents, such as ricin, might be disseminated through the mail.

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LAW OFFICES OF RONALD M. ANDERSON
600 - 108th Avenue N.E., Suite 507
Bellevue, Washington 98004
Telephone: (425) 688-8816 Fax: (425) 646-6314

To address the issue of biological agents in mail, it has been suggested that all items of mail should be exposed to levels of radiation sufficient to kill such biological agents before the mail is otherwise processed and distributed, thus eliminating the danger posed by such biological agents. Unfortunately, recent experience within the U.S. Patent and Trademark Office has indicated that irradiation of mail can lead to significant deterioration of the contents of such mail, nor can irradiation detect the presence of biological agents, even should such agents be rendered harmless. From a security and law enforcement perspective, it is highly desirable to detect an occurrence of mail contamination, as such knowledge will greatly aid law enforcement agencies in any investigation into the source of the contamination.

Furthermore, terrorists can employ the mail system to disseminate non-biological agents as well. There are documented cases of explosives (e.g., letter bombs) being shipped through the mail. During the United States military operations in Afghanistan in the fall of 2001, indications were found that terrorists had obtained quantities of radioactive material, which could conceivably have been employed to contaminate the USPS.

Applicants' invention seeks to identify mail within the postal system that is contaminated with *anthrax* spores, or other biological, chemical, explosive, or radioactive agents. While analytical devices and methods are available for detecting such agents, such equipment and methods are not readily adapted for incorporation into high volume mail processing equipment. One embodiment of the present invention is directed to a method and a sampling system for automatically screening incoming mail to detect potential chemical and biological threats. While it is contemplated that the present invention will be very useful for sampling mail, other types of packages, such as luggage, can also be sampled using the principles of the present invention. Thus, the detailed description of the mail sampling embodiment described in the present application should be considered to represent an exemplary application of the present invention, but clearly is not the only application. Those of ordinary skill in the art will appreciate that the elements of the present invention are also applicable to the screening of a plurality of different types of closed packages, such as, but not limited to, mail, luggage, shipping cartons, consumer goods, and the like.

The mail sampling embodiment of the present invention includes a plurality of subsystems, including means for accessing particulates associated with a parcel (either from within the parcel, or emanating from the parcel), means for aerosolizing any such particulates, a triggering sampler that determines if a threat may exist in the sample based upon the relative number of particulates contained in the sample or upon a quality of the particulates, and a detecting sampler that obtains a sample that can be analyzed to identify a threat. Optional additional subsystems include an archiving sampler that retains a solid sample of the particulates for archival purposes, one or more identification units for processing a sample to determine if the particulates are a specific chemical or

LAW OFFICES OF RONALD M. ANDERSON
600 - 108th Avenue N.E., Suite 507
Bellevue, Washington 98004
Telephone: (425) 688-8816 Fax: (425) 646-6314

biological agent, and a decontamination system for decontaminating a parcel identified as a potential threat. Further preferred subsystems include a controller for automated control of the mail sampling system, an alarm to notify personnel of potential threats, fluid flow virtual impactors for separating an air sample into a major flow with few particulates of greater than a predetermined size and a minor flow with significantly more particulates greater than the predetermined size, and rotating arm impact collectors for removing particulates from a fluid flow. Preferably, the system is equipped with high efficiency particle air (HEPA) filters on its outflow and operates under negative pressure to reduce a risk of spreading contaminants beyond the system.

Applicants' Search of the Prior Art

Applicants conducted an on-line search of the patent databases of the U.S. Patent and Trademark Office. Several different keyword searches were employed, as well as searches based on U.S. Classes. The keyword searches included the terms "parcel screening," "luggage screening," and "explosives detection." The classes searched included 73/41, 73/28.01, 73/28.04, 73/863.01, 73/863.11, 73/863.12, 73/863.21, 73/863.23, and 73/863.25. The most relevant references are identified and discussed below.

U.S. Patent No. 3,997,297 (Jenkins et al.) (US1)

Summary: Discloses a method and apparatus for detecting the presence of a particular constituent in a sampled atmosphere. The sample is drawn through two substantially identical flow paths, each path containing a detector. The conditions prevailing in one of the flow paths is such as to convert the particular constituent into matter, which will not produce a response in the associated detector. When the particular constituent is vapor originating from an explosive, the conversion can be by heating the flow path to a temperature at which the vapor breaks down into components that do not produce a response in the associated detector. In the absence of the particular constituent in the sampled atmosphere, the signals from the two detectors are substantially equal, but the presence of the particular constituent results in a difference in signals from the two detectors.

Relevance: The Jenkins reference discloses the use of two different detectors for detecting the presence of a target compound in air. This reference indicates that the detection of target compounds in air is well understood. However, Jenkins does not teach or suggest a triggering sampler, as recited in the claims defining applicants' invention.

U.S. Patent No. 4,111,049 (Lerner et al.) (US2)

Summary: Apparatus is described for securing vapor samples, particularly from articles such as suitcases, travel bags, packages, and the like. The apparatus may include several depressor arms hinged above a station along a conveyor belt or the like. A sampling probe for sampling vapor expelled from the articles is positioned at the station. As the articles are carried by the conveyor past the station, they lift the arms, which are suitably hinged above them so that the weight of the arms

LAW OFFICES OF RONALD M. ANDERSON
600 - 108th Avenue N.E., Suite 507
Bellevue, Washington 98004
Telephone: (425) 688-8816 Fax: (425) 646-6314

causes a part of the vapor accumulated in the article to be expelled. The expelled vapor is sampled by the probe at the station and may be carried to a suitable vapor analyzer for test.

Relevance: The Lerner patent discloses obtaining a particle sample from a closed container by applying a force to the container, and then providing the particle sample that was obtained to a detector. Lerner does not teach or suggest a triggering sampler.

U.S. Patent No. 4,580,440 (Reid et al.) (US3)

Summary: Reid discloses a method for detecting contraband substances in freight cargo containers in which the container is agitated to disturb particulates therein, and air containing such particulates is then sampled and the particulates are collected. The collected particulates include naturally occurring particulates, which have absorbed vapors of the contraband substance during the entire time that the container has been closed, and also include particulates of the contraband substance itself. The collected particulates are heated to drive off vapors indicative of the contraband substance, and the vapors are analyzed in a mass analyzer.

Relevance: The Reid patent discloses obtaining a particle sample from a closed container by agitating the container, collecting an air sample with particulates, separating the particulates from the air, and heating the particulates to generate a vapor, which is then analyzed. Reid does not teach or suggest a triggering sampler.

U.S. Patent No. 4,820,920 (Bather) (US4)

Summary: This reference teaches a method for detecting a dangerous substance such as explosives or drugs in an article in transit. The method comprises the steps of taking a sample of atmosphere from the vicinity of the article, causing the sample to enter an ionization chamber of a mass spectrometer, obtaining a mass spectrum of one or more constituents of the sample, comparing the mass spectrum with one or more reference spectra, and generating a signal indicative of any dangerous substance in the sample.

Relevance: The Bather patent discloses obtaining an air sample proximate a closed container. An electromagnetic pulse can be applied to the object to cause contaminants associated with the container to volatilize. The sample is then analyzed using mass spectrophotometery. Bather does not teach or suggest a triggering sampler.

U.S. Patent No. 5,299,141 (Hungerford et al.) (US5)

Summary: Hungerford discloses fluid sampling apparatus provided as a unitary structure that automatically collects fluid samples according to modes of operation selected by a user, while monitoring an analyte of interest on a real-time basis. The apparatus responds to signals from a fiber optic sensor, and collects and stores sampling and analyte data for later retrieval. The user may select from various modes of operation, including sampling triggered by a predetermined value(s) of the analyte, flow proportional sampling, and/or sampling at predetermined time intervals. The apparatus

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600 - 108th Avenue N.E., Suite 507
Bellevue, Washington 98004
Telephone: (425) 688-8816 Fax: (425) 646-6314

includes a self-contained microprocessor, together with associated program and data memory, for automatically controlling sampling operations, calculating analyte values on the basis of signals from the fiber optic sensor, calculating flow rate on the basis of signals from a flow sensing arrangement, and storing data relating to sample collection, analyte levels, and flow rate. The apparatus is further adapted to measure and store the actual discharge volume of the analyte loaded into a receiving fluid body, with the program memory being programmed to calculate loading values on the basis of flow rate values and analyte values as detected from any type of sensor capable of in situ real-time analyte measurement. Stored data can be called up on a display of the apparatus, or transferred to an external output device via a modem and telecommunication network or a portable data transfer unit.

Relevance: The Hungerford reference discloses using a triggering sampler to continually monitor a flow of fluid, and based on the triggering sampler determining that a predefined value has been exceeded, the system obtains a fluid sample for subsequent analysis. The fluid sample system is very simple in that it only need be capable of diverting a flow of fluid into a receiver. While Hungerford teaches a triggering sampler, Hungerford is employed to collect liquid samples, such as from a sewer or discharge pipe, not to collect particulates from mail, and not by sampling air.

U.S. Patent No. 5,585,575 (Corrigan et al.) (US6)

Summary: This reference discloses an explosive detection screening system used for the detection of explosives and other controlled substances such as drugs or narcotics. The screening system detects the vapor and/or particulate emissions from the aforementioned substances and reports that they are present on an individual or object and the concentration of each substance detected. The screening system comprises a sampling chamber for the collection of the vapor and/or particulate emissions, a concentration and analyzing system for the purification of the collected vapor and/or particulate emissions and subsequent detailed chemical analysis of the emissions, and a control and data processing system for the control of the overall system.

Relevance: The Corrigan reference discloses obtaining a sample from a person or object, then providing that sample to two different sampling systems, including a first sampling system that vaporizes particulates and analyzes vapors, and a second that concentrates the sample before analysis. Corrigan does not teach or suggest a triggering sampler.

U.S. Patent No. 5,760,314 (Bromberg et al.) (US7)

Summary: A sampling apparatus is disclosed for collecting a sample of air from a subject such as a person. The apparatus includes a bypass that divides the sample air stream into a bypass portion and a collector portion. The collector portion of the air stream is delivered to a collector which traps entrained particles. After the sampling cycle is completed, a mechanical conveyor removes the collector from fluid communication with the bypass and transports it to an analyzing unit. A chamber in the unit receives the collector, and a diverter couples the chamber with either of

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600 - 108th Avenue N.E., Suite 507
Bellevue, Washington 98004
Telephone: (425) 688-8816 Fax: (425) 646-6314

two vapor and/or particle analyzers. During analysis, a heater in the unit heats both the chamber and the diverter. A sample collected from one subject can be analyzed in one of the analyzers while another sample is being collected from another subject. The other analyzer can then be used to analyze the second sample.

Relevance: The Bromberg patent discloses collecting an air sample adjacent an object or person, separating any particles from the air sample, heating the particles, and then analyzing the collected particles using paired analyzers. Bromberg does not teach or suggest a triggering sampler.

U.S. Patent No. 6,324,927 (Oranth et al.) (US8)

Summary: Oranth teaches a cargo sampling system that encloses a cargo container in a sealed chamber. The cargo container is agitated so that particulates and vapors are released from the cargo container. Blasts of air are directed at the cargo container to further dislodge particulates. The chamber undergoes successive cycles of pressurization and depressurization. Collected particulates and vapors are analyzed in real-time using conventional analytical tools to detect contaminants such as explosives, drugs, and biological agents.

Relevance: The Linker reference discloses placing a container in a containment area, air jets and agitation to dislodge particles and vapors, which are then collected and analyzed. Oranth does not teach or suggest a triggering sampler.

U.S. Patent No. 6,334,365 (Linker et al.) (US9)

Summary: Linker teaches a portal apparatus for screening persons or objects for the presence of trace amounts of target substances such as explosives, narcotics, radioactive materials, and certain chemical materials. The portal apparatus can have a one-sided exhaust for an exhaust stream, an interior wall configuration with a concave-shape across a horizontal cross-section for each of two facing sides to result in improved airflow and reduced washout relative to a configuration with substantially flat parallel sides, air curtains to reduce washout, ionizing sprays to collect particles bound by static forces, as well as gas jet nozzles to dislodge particles bound by adhesion to the screened person or object. The portal apparatus can be included in a detection system with a pre-concentrator and a detector.

Relevance: The Linker reference discloses placing a container (or person) in a containment area, air jets to dislodge particles, which are collected, pre-concentrating particle laden air, and then separately collecting and analyzing the particles and any vapors. Linker does not teach or suggest a triggering sampler.

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LAW OFFICES OF RONALD M. ANDERSON
600 - 108th Avenue N.E., Suite 507
Bellevue, Washington 98004
Telephone: (425) 688-8816 Fax: (425) 646-6314

Novelty of Applicants' Invention in View of the Identified Prior Art

Applicants' broadest independent claim, Claim 1, is reproduced below:

> 1. A system for detecting hazardous particles associated with a parcel, comprising:
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> (a) a housing into which a parcel to be analyzed can be placed, so that a parcel can be isolated from an environment outside the housing;
>
> (b) a triggering sampler in fluid communication with a volume of air within said housing, said triggering sampler capable of detecting particles associated with a parcel that are entrained within the volume of air in said housing, said triggering sampler generating a detection signal in response to the detection of such particles; and
>
> (c) a detecting sampler in fluid communication with said volume of air and electrically coupled to respond to the detection signal from said triggering sampler, said detecting sampler, in response to said detection signal, removing particles entrained within said volume of air, thereby obtaining a sample of particles, to enable an analysis to determine if particles associated with a parcel that are collected by the detecting sampler are hazardous.

While the art discussed above is indicative of many different systems for collecting particles for analysis, none of this art discloses the use of a triggering sampler in conjunction with collecting particles from a parcel. Several of the references disclose the use of multiple detectors that are employed to analyze particles collected from an object (or vapors from a particle that is collected and then heated). In particular, Linker, Corrigan and Bromberg disclose the use of paired detectors. However, none of these references suggests employing one detector as a trigger that controls the operation of a second detector. Also, none of the references relating to collecting and analyzing particles teach or suggest using one detector as a trigger to determine when a sample of particle should be collected for further analysis. Applicants note that the art relating to the detection of particle contaminants in luggage, or on persons, is quite crowded. Much of the art employs x-ray based detection, as opposed to the collection of particles, and is thus not relevant to the claims in the present application and is not represented above.

The only reference found that discloses the use of any form of triggering detector is Hungerford, which applies the concept of a triggering detector to a significantly different sampling problem. While Hungerford's device includes a triggering sampler and a detecting sampler, the samplers disclosed in Hungerford are not equivalent to those recited in applicants' claims. With respect to the triggering sampler described by Hungerford, the reference describes the triggering

LAW OFFICES OF RONALD M. ANDERSON
600 - 108th Avenue N.E., Suite 507
Bellevue, Washington 98004
Telephone: (425) 688-8816 Fax: (425) 646-6314

sampler as monitoring at least one predetermined value of a specific substance being monitored. Hungerford describes the triggering sampler as a sensor that senses changes in a clad portion (33A), which is particularly responsive to a chemical or analyte; the refractive index of the clad portion (33A) changes so that the amount and angles of light internally reflected from the core-clad interface (34) also changes. The resulting change in light transmission along core (32) in turn results in a change in the intensity and/or angle of light signals detected by a photodetector (36), and the change may be correlated to a known relationship between the analyte of interest and the clad portion. Hungerford discloses another embodiment of the triggering sampler as a reservoir type fiber optic sensor in which the sensing element comprises a reagent that interacts with an analyte of interest. The reagent is disposed at the tip of the optical fiber, as part of a sensor package containing a plurality of fiber optic sensors, each responsive to a different analyte of interest. A level of total suspended solids is one criterion that the triggering sampler can monitor. It should be noted that total suspended solids is a term used only in describing a characteristic of a liquid, but not a gas (or air).

Clearly, Hungerford's triggering sampler is not usable for detecting particulates in an air stream, but rather is intended for detecting a specific analyte or chemical in a liquid stream, or detecting total suspended solids in a liquid. Further, Hungerford specifically describes obtaining a liquid sample for the detecting sampler once the triggering samples provide a signal. Applicants positively recite removing particles entrained within a volume of air, thereby obtaining a sample of ***particles***. Thus, the detecting sampler disclosed by Hungerford is not equivalent to applicants' detecting sampler, because the detecting sampler of Hungerford employs bottles that are filled with liquid, and such a sampler is not capable of removing and responding to particles in an airflow. As should be apparent from applicants' specifications, particles are generally separated from an airflow using an impact collector, several types of which are described in great detail therein. Logically a sampler that collects and stores a volume of liquid for later analysis simply comprises a container capable of storing a volume of liquid, whereas a sampler that removes particles from air to provide a sample of such particles must be something more than a container capable of storing a volume of liquid. Clearly, Hungerford's detecting sampler is not equivalent to applicants' detecting sampler, as recited in Claim 1.

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LAW OFFICES OF RONALD M. ANDERSON
600 - 108th Avenue N.E., Suite 507
Bellevue, Washington 98004
Telephone: (425) 688-8816 Fax: (425) 646-6314

To achieve an equivalent invention, the device of Hungerford would need to be modified to include a containment housing into which an air stream could be isolated, and the triggering and detecting samplers would need to be changed to be responsive to, or to collect, particles entrained in an air stream. It appears that such changes would make the device unsuitable for its intended purpose. Note that Hungerford clearly describes a device for use in streams, waterways, or sewers. Should Hungerford be modified to include a detecting sampler that removes particles from air to provide a sample of such particles, the resulting device would no longer provide a sample of a liquid, as it would have been modified to provide a sample of particles. Thus, the required modification would result in a device ***unsatisfactory for its intended purpose*** (see MPEP 2143.01), because the purpose of Hungerford's device was to obtain a sample of a liquid, not a sample of particles. Thus, such a modification does not provide a basis for a *primae facie* case of obviousness.

With respect to the art discussed above that discloses collecting particles from a closed container, none of those references disclose or suggest the use of a triggering sampler. There does not appear to be any basis for concluding that it would have been obvious to modify any of those references to include a particle detecting triggering sampler. In each reference, the art clearly describes devices in which samples are continually collected and processed, in real-time, by at least one integrated analytical device. Particularly in the art disclosing detecting hazardous agents associated with luggage or other containers, there does not appear to be any recognition that any benefit would accrue by including a triggering sampler as described by applicant. In Hungerford's device, the liquid sample is collected for offsite analysis. Thus, Hungerford only collects a liquid sample when a triggering sampler indicates a need for a liquid sample, thereby reducing the number of sample containers the system needs to provide for operation over an extended time. The art related to detecting hazardous agents associated with luggage or other containers all include onboard means for analysis, so reducing the volume required for containers to store samples provides no motivation, as *no samples are stored*, (each sample being analyzed immediately).

Because none of the art discussed above describes an equivalent invention to that defined by applicants' claims, and because there appears to be no reasonable basis for modifying any of the above noted references to achieve the recited invention, it appears that the present invention recites patentable subject matter in view of this art. Applicants' dependent claims recite additional elements that further distinguish over the cited art, such as the use of virtual impactors, radial arm collectors, and an archival sampler.

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LAW OFFICES OF RONALD M. ANDERSON
600 - 108th Avenue N.E., Suite 507
Bellevue, Washington 98004
Telephone: (425) 688-8816 Fax: (425) 646-6314

Conclusion

Having fulfilled the requirements for a Petition to Make Special, applicants request that prosecution of the present application be expedited forthwith. Should any questions arise during prosecution, the Examiner is asked to telephone applicants' attorney at the number listed below, to further expedite the prosecution of the instant application.

Respectfully submitted,

Ron Anderson

Ronald M. Anderson
Registration No. 28,829

I hereby certify that this correspondence is being deposited with the U.S. Postal Service in a sealed envelope as first class mail with postage thereon fully prepaid addressed to: Director of the Patent and Trademark Office, Arlington, VA 22202, on April 16, 2002.

Kathy Pamiro

Date: April 16, 2002
RMA/MCK:ssa

Enclosures
Information Disclosure Statement
Information Disclosure Statement Listing
9 References

LAW OFFICES OF RONALD M. ANDERSON
600 - 108th Avenue N.E., Suite 507
Bellevue, Washington 98004
Telephone: (425) 688-8816 Fax: (425) 646-6314